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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,320	10/19/2001	Mohammad Usman	0037203-4	7230

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EXAMINER
SINGH, RAMNANDAN P

ART UNIT	PAPER NUMBER
2646	

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>09 February 2005</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-46</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) <u>1-38,44 and 46</u> is/are allowed.

6)☒ Claim(s) <u>39-43, 45</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments with respect to claims 39 and 45 filed on Feb. 09, 2005

have been fully considered but they are not persuasive.

Applicant's argument---" at least one embodiment of the applicant's claimed

inventions is directed toward the derivation of a subset of a first set of coefficients, the

use of that subset to derive a signal used to generate an error signal and the correction

of the first set of coefficients using the error signal" on page 14.

Examiner's response—In response to the above argument, the examiner asserts

that claims 39 and 45 do not require using the derivation of a subset of a first set of

coefficients (i.e. the second set of coefficients) to generate the error signal.

2.   **Status of Claims**

        Claims 1 and 45 are amended.

        Claims 1-46 are pending.

Claim Rejections - 35 USC § 103

3.   The text of those sections of Title 35, U.S. Code not included in this action can

be found in a prior Office action.

4.   Claims 39-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Virdee [US 5,473,686] in view of Kastle [US 6,654,623 B1].

Regarding claim 39, Virdee teaches an adaptive filter 212, as shown in Fig. 2,

comprising:

a filter input for receiving a first signal (224);

a filter output for outputting a second signal (213) based upon said first signal;

an error input for receiving an error signal (214) ;

a plurality of first coefficients, each having an associated energy, wherein the first

coefficients are modified based upon the error signal (214); and

an average energy value of all coefficients [col. 8, lines 11-20].

Virdee does not teach expressly using low-end and high-end energy thresholds

to compute a start coefficient and an end coefficient for selecting a plurality of second

coefficients as a subset of the first coefficients. It may, however, be noted that using two

energy thresholds—low and high thresholds—to identify two filter coefficients is well-

known in the art. Further, Virdee also teaches adjusting filter length to generate second

coefficients, regardless of which criterion is applied to select the second coefficients

[col. 8, lines 52-64].

Kastle teaches a method of selecting a start coefficient (i.e. **low energy**

coefficient) and end coefficient (i.e. **high energy coefficient**) by applying at least one

threshold value to an energy value (i.e. **lower energy threshold**) [col. 5, lines 31-37]

and (i.e. **(high) energy threshold**) [col.5, lines 9-16], the energy value being a function

of the energy of a plurality of first coefficients [col. 11, lines 4-12]. This is nevertheless a

teaching to one of ordinary skill in the art to do the same thing in an adaptive filter by

selecting a second set of coefficients having the low energy coefficient as a start-

coefficient and the high energy coefficient as an end-coefficient [Kastle: col. 1, lines 56-

59; col. 5, lines 48-55].

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to apply the method of Kastle to Virdee to adjust the filter length by

providing an adequate length of the adaptive filter in order to cancel echoes optimally in

most environments [Virdee: col. 4, lines 29-39].

Regarding claim 40, Kastle teaches determining the start coefficient by

identifying a first coefficient having an associated energy substantially equal to the low-

end threshold value multiplied by the predetermined percentage (i.e. **a given factor**) of

a sum of the energy of the plurality of first coefficients [col. 5, lines 31-37]; and

determining the end coefficient (i.e. **high energy coefficient**) by identifying a last

coefficient having an associated energy substantially equal to the high-end threshold

value multiplied by the predetermined percentage (i.e. **a given factor**) of a sum of the

energy of the plurality of first coefficients [col. 5, lines 9-16].

Regarding claims 41-43, the limitations are shown above.

5.   Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Azriel [US 6,724,736 B1] in view of Virdee [US 5,473,686] and further, in view of Kastle [US 6,654,623 B1].

Regarding claim 45, Azriel teaches a gateway 42 operative to transmit signals between a circuit switched network (i.e. **PSTN)** and a packet based network shown in Fig. 2 [col. 1, line 61 to col. 2, line 19; col. 2, line 63 to col. 3, line 2; col. 3, lines 16-23], comprising: a plurality of digital to analog encoders and decoders (i.e. **Fig. 4, elements 93, 95, 107, 109)** ; and an echo cancellation device [col.. 8, lines 23-44]. Details about adaptive echo cancellation filtering are not shown. So one of ordinary skill in the art would have been motivated to seek any known adaptive filter used in an echo canceller, such as Virdee.

Virdee teaches an adaptive filter 212, as shown in Fig. 2, comprising:

a filter input for receiving a first signal (224);

a filter output for outputting a second signal (213) based upon the first signal;

an error input for receiving an error signal (214) ;

a plurality of second coefficients , each having an associated energy, wherein the second coefficients are modified based upon the error signal (214); and

an average energy value of all coefficients [col. 8, lines 11-20].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide the adaptive filter of Virdee with the echo canceller of Azriel to cancel echoes.

However, Virdee does not teach expressly using low-end and high-end energy thresholds to compute a start coefficient and an end coefficient for selecting a plurality of second coefficients as a subset of the first coefficients. It may, however, be noted that using two energy thresholds—low and high thresholds—to identify two filter coefficients is well-known in the art. Further, Virdee also teaches adjusting filter length to generate second coefficients, regardless of which criterion is applied to select the second coefficients [col. 8, lines 52-64].

Kastle teaches a method of selecting a start coefficient (i.e. **low energy coefficient**) and end coefficient (i.e. **high energy coefficient**) by applying at least one threshold value to an energy value (i.e. **lower energy threshold**) [col. 5, lines 31-37] and (i.e. **(high) energy threshold**) [col.5, lines 9-16], the energy value being a function of the energy of a plurality of first coefficients [col. 11, lines 4-12]. This is nevertheless a teaching to one of ordinary skill in the art to do the same thing in an adaptive filter by selecting a second set of coefficients having the low energy coefficient as a start-

coefficient and the high energy coefficient as an end-coefficient [Kastle: col. 1, lines 56-59; col. 5, lines 48-55].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the method of Kastle to Virdee to adjust the filter length by providing an adequate length of the adaptive filter in order to cancel echoes optimally in most environments [Virdee: col. 4, lines 29-39].

Allowable Subject Matter

6.   Claims 1-38, 44 and 46 are allowable

The following is a statement of reasons for the indication of allowable subject matter:

Claim 1 identifies the uniquely distinct feature of an adaptive filter for echo cancellation, comprising: a filter input for receiving a first signal; a filter output for outputting a second signal based upon the first signal; an error input for receiving an error signal; a plurality of first set coefficients, each having an associated energy, wherein the first set of coefficients are modified based upon the error signal; and a plurality of second set of coefficients having a start coefficient and an end coefficient, the second coefficients being a subset of the first set of coefficients, wherein the start coefficient and end coefficient are determined by applying at least one threshold value to an energy value, the energy value being a function of the energy of a plurality of first set of coefficients, wherein the second set of coefficients are used to derive the error

signal. As such claim 1 requires deriving the error signal using the second set of

coefficients. While the closest prior art, Virdee [US 5,473,686], Kastle [US 6,654,623

B1] and Strait [US 6,266,367 B1] each teach adaptive filtering, Virdee using a plurality

of first coefficients, Kastle selecting a start coefficient and an end coefficient, and Strait

exploiting pole-zero modeling; none of them show or suggest to utilize the second set of

adaptive filter coefficients to derive the error signal. As such, the prior art, either

singularly or in combination , fail to anticipate or render the above underlined limitation

obvious. Therefore, claim 1 is allowable.

Claims 20, 44 and 46 are essentially similar to claim 1 and hence they are also

allowable.

Claims 2-19 and 21-38 are allowable due to dependence from claims 1 and 20

respectively.

Conclusion

7.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Ramnandan Singh whose telephone number is (571)

272-7529. The examiner can normally be reached on M-TH (8:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Tran Sinh can be reached on (571) 272-7564. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

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Business Center (EBC) at 866-217-9197 (toll-free).

Ramnandan Singh
Examiner
Art Unit 2646
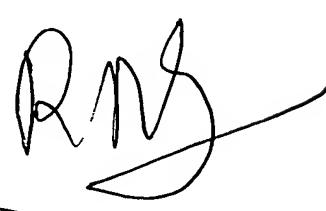
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